DESIGNING, making and collecting puzzles is an interesting and entertaining hobby that you can share with everyone. Since the puzzles are made from bits of wire, wood, plastics, string or cardboard, it costs practically nothing to make them. Puzzles make excellent gift items and if you are looking for an item to make and sell, these puzzles should find a ready market.

Different types of puzzles appeal to different people. For example, plane geometry puzzles as in Figs. 3 and 6 interest women who enjoy sewing, because solving these puzzles is somewhat like arranging paper patterns on cloth. Artists, engineers and draftsmen, because of their ability to visualize in three dimensions, like the wire or burr puzzles (Fig. 4). Single-plane manipulation puzzles as in Figs. 8 and 9 appeal to people who like to plan things ahead, because several
advance moves can be "seen" and anticipated before they are actually made. Carpenters, cabinetmakers and people who like to work with wood will appreciate the puzzles in Fig. 1.

Detailed instructions for making 11 different puzzles follow. After making, test your skill at solving them and then check with the solutions on pages 125 and 126.

**Puzzles A and B.** These are plane geometry puzzles and probably the easiest to make. Lay out the pieces as in Figs. 6 and 7 on cardboard,

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**Puzzle D**

Plastic or plywood and cut them out. Cutting up a square marked out from the solution of the puzzle takes away the challenge of solving the puzzle yourself. If plywood is used, lay out the pieces so that the wood grain is running in a different direction on each piece (Fig. 3). Otherwise the grain may give a clue to the solving of the puzzles. The object of each puzzle is to arrange the pieces to form a perfect square. There are two solutions to puzzle A (Fig. 6), one including the use of piece 4 and one without using piece 4. Often these types of puzzles can be arranged to form other shapes such as a tee or cross for the solution.

**Puzzles C and D.**

These are movement puzzles, the solutions to which result from the interchanging of the lettered blocks (Figs. 8 and 9) by sliding (not lifting) the blocks within a frame. Make the
base and frame of 1/4-in. plywood and glue together. Then cut the blocks from clear 3/16-in. thick Lucite or Plexiglas plastic and letter two of the blocks as in Fig. 8 or 9. The solution to puzzle D, although similar to puzzle C, is a bit more complex because the free space is only half the size of part A.

Puzzles E and F. Block or burr puzzles can be made in many designs and shapes. Two assembled puzzles are shown in Fig. 1. Try puzzle E (Fig. 10) first because it is easier to make and solve than puzzle F (Fig. 11). Any type of wood can be used; however, birch, mahogany or walnut is best because woods of this type wear better than soft woods and are easier to work than the harder woods. The notches (Fig. 10) can be roughed out on a circular saw or bored out. The slots should be loose fitting enough to permit the blocks to slide, yet tight enough to hold the assembled puzzle together. After solving puzzle E, work on puzzle F which has six pieces and is much more difficult to solve. The key to solving any burr puzzle is to notice the various notches on each piece. The sides on which the notches go all the way through are on the inside face of the assembled puzzle. Another clue is the interior volume of the puzzles. The total volume at the joint must be filled by parts of the several pieces.

Wire Puzzles G and H.
These are fairly easy to make, requiring only a pair of pliers and a few wire coat hangers or baling wire. Details for making two puzzles of this type are given in Figs. 12 and 13. The object of puzzle G is to either put the two pieces together as in Fig. 4 or take them apart. Either course can be equally intriguing. The object of puzzle H is to remove the wire ring X in Fig. 13 and then replace it. Clues to look for in solving this type of wire puzzle are the relative sizes of the loops and rings because one must pass within or over the other.

String Puzzles J and K.
These puzzles are usually made up of a combination of string, beads, wooden sticks and wire. The object of puzzle J (Fig. 14) is to remove the wire rings, and then replace them. In puzzle K (Fig. 15) the object is to get both beads
Puzzle inventors and hobbyists Jerry and Margot Slocum with their puzzle display board exhibiting some of their collection of 300 puzzles. If you are a puzzle hobbyist and would like to correspond with the Slocums, their address is: 3377 Bagley Ave., Los Angeles 34, California.

Craft Prints in enlarged size for building novelty projects are available at $1.00 each. Order by print number, enclosing remittance (no C.O.D.'s or stamps) from Craft Print Dept., SCIENCE AND MECHANICS, 450 East Ohio Street, Chicago 11, Illinois.

on the same loop.
Some clues to help you solve string puzzles are: the length of the string, the size of the holes and whether the string is permanently fastened to the support bar as in Fig. 14 or if the string is pulled through a hole in the support bar as in Fig. 15. A long string indicates large loops can be made to pass various puzzle parts through. Large holes with only one string through them mean that several other loops of string can be passed through the same hole to solve the puzzle. No fair removing permanently fastened strings.

Peg Puzzle L. Make up as in Fig. 16. The object of this peg puzzle is to interchange the colored pegs by moving each peg individually into an adjacent hole or by jumping one peg only of either color. No pegs may be moved or jumped backward.
You can also improvise this puzzle from perforated hardboard or tile.
Still Puzzled? Here Are Solutions

WITHOUT SQUARE

WITH SQUARE

A   TWO SOLUTIONS

B

APPROX. THREE MOVES BETWEEN EACH OF THE DIAGRAMS BELOW

1  2  3  4  5  6  7

START

I

II

III

NUMBERS FOR REFERENCE ONLY

IV

V

VI

SEQUENCE OF MOVES AT EACH STEP SHOWN IN BLACK NUMBERED ARROWS

START

1ST

3RD

2ND

D

NUMBERS IN SQUARES FOR REFERENCE ONLY

E

SEQUENCE OF MOVES INDICATED BY NUMBERS

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Assemble pieces No. 1, 4 and 5 in one subassembly, and No. 2, 3, and 6 in another subassembly. Then slide the two groups together, with No. 4 sliding alongside No. 6.

First, move ring this position. Object: To remove ring. Second, swing loop up.

Third, dotted line shows path ring must travel to be removed.

To solve above puzzle, first get both beads into one central loop by working the cords out of the center hole as shown in Steps No. 1, 2 and 3. Then replace the looped cord through the center hole with the beads on one side by retracing steps used to get center loop off.

At each stage, moves are marked in sequence. Moves shown above diagram are jumps; moves shown below diagram are moves to an adjacent hole.